

DT13 Rec'd PCT/PTO 36 MAY 2003

Docket No. 3875-4138US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): David McKinnon and Jane Dixon

Group Art Unit: TBA

Serial No.: 09/786,108

Examiner: Patricia A. Booker

Filed: February 27, 2001

For: Mammalian ELK Potassium Channel Genes

EXPRESS MAIL CERTIFICATE

Express Mail Label No.: EV 245 489 465US

Date of Deposit: May 6, 2003

I hereby certify that the following attached paper(s) and/or fee

1. Response to Notification of Defective Response;
2. Copy of Notice;
3. Copy of executed Combined Declaration and Power of Attorney;
4. Copy of Response;
5. Copy of Fee Transmittal Letter;
6. Copy of postcard;
7. Substitute disk and paper copy of Sequence Listing;
8. Statement Under 37 CFR 1.821(b);
9. Return Postcard.

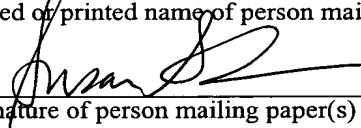
is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. §1.10 on the date indicated above and is addressed to the Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

05/09/2003 59950330 00000990 134500 03785106

01 FD:1617 120.00 CH
02 FD:1386 300.00 CH

Susan Shen

(Typed or printed name of person mailing papers(s) and/or fee)


(Signature of person mailing paper(s) and/or fee)

Correspondence Address:

MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154-0053
(212) 758-4800 Telephone
(212) 751-6849 Facsimile

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): David McKinnon and Jane Dixon
U.S. Serial No.: 09/786,108
Filed: February 27, 2001
International
Application No.: PCT/US99/19902
I.A. Filing Date: August 31, 1999
Priority Date: August 31, 1998
For: Mammalian ELK Potassium Channel Genes

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTIFICATION OF DEFECTIVE RESPONSE

Sir:

This is in response to the Notification of Defective Response due May 9, 2003 for the above U.S. National filing based on International Patent Application PCT/US99/19902 filed on August 31, 1999.

According to the Notice, an Oath and Declaration was not provided to the USPTO. The executed Combined Declaration and Power of Attorney was filed on June 18, 2001 along with the amended Sequence Listing. Enclosed herewith is a copy of the signed Combined Declaration and Power of Attorney filed on June 18, 2001 correctly identifying the application by the international application number and

international filing date, specifically PCT Application No. PCT/US99/19902 filed August 31, 1999. Also enclosed is a copy of the postcard acknowledging receipt of the Declaration.

Also enclosed is the fee transmittal paper indicating the fees and number of independent claims in the above application. Please note as indicated by the fee transmittal enclosed that the (2) additional independent claims have already been paid for in full by the check submitted with the filed preliminary amendment. There are (5) total independent claims, and (2) independent claims in excess of the (3) permitted claims; not (5) claims in excess as stated in the Notification of Defective Response.

The enclosed Substitute Sequence Listing and disc copy are submitted at the request of the Examiner because the one submitted with the Response of June 18, 2001 has been damaged. The Substitute Sequence Listing is a direct copy of the Sequence Listing submitted to the USPTO on June 18, 2001.

Conclusions

It is believed based on the above information that there should be no fees required with the above response. However, should the Commissioner determine fees are due, the Commissioner is hereby authorized to charge any additional fees which may be required for the consideration of this response under 37 C.F.R, or credit any overpayment to Deposit Account No. 13-4500, Order No. 3875-4138US1.

A DUPLICATE COPY OF THIS PAGE IS ENCLOSED.

international filing te, specifically PCT Application No. PCT/US99/19902 filed August 31, 1999. Also enclosed is a copy of the postcard acknowledging receipt of the Declaration.

Also enclosed is the fee transmittal paper indicating the fees and number of independent claims in the above application. Please note as indicated by the fee transmittal enclosed that the (2) additional independent claims have already been paid for in full by the check submitted with the filed preliminary amendment. There are (5) total independent claims, and (2) independent claims in excess of the (3) permitted claims; not (5) claims in excess as stated in the Notification of Defective Response.

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Conclusions


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A DUPLICATE COPY OF THIS PAGE IS ENCLOSED.

If any issues remain, or if there are any suggestions for expediting allowance of this application, it is respectfully requested that the undersigned be contacted at the telephone number listed below.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: May 6, 2003



Keith McWha
Registration No. 44, 235

Correspondence Address:

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New York, NY 10154-0053
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(212) 751-6849

Telephone
Facsimile



UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED
SECRET DEPT.Commissioner for Patents, Box PCT
United States Patent and Trademark Office
Washington, D.C. 20233
www.uspto.gov

U.S. APPLICATION NUMBER NO.	2003 APR 15 A 7:14 FIRST NAMED APPLICANT	ATTY. DOCKET NO.
09/786,108	David McKinnon MORGAN & FINNEGAN LLP	3875-4138US

INTERNATIONAL APPLICATION NO.	
PCT/US99/19902	
I.A. FILING DATE	PRIORITY DATE
08/31/1999	08/31/1998

Maria C H Lin
Morgan & Finnegan
345 Park Avenue
New York, NY 10154-0053

CONFIRMATION NO. 6832
371 FORMALITIES LETTER



OC000000009790396

Date Mailed: 04/09/2003

NOTIFICATION OF DEFECTIVE RESPONSE

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as a Designated Office (37 CFR 1.494):

- Priority Document
- Copy of the International Application filed on 06/18/2001
- Biochemical Sequence Diskette filed on 06/18/2001
- Biochemical Sequence Listing filed on 06/18/2001
- Copy of references cited in ISR filed on 06/18/2001
- U.S. Basic National Fees filed on 06/18/2001
- Assignee Statement filed on 06/18/2001

CASE 03875-4138^{US} ATTY LIN
DUE May 9, 2003
1 mo. call-up _____
BY J.M.

Applicant's response filed 06/18/2001 is hereby acknowledged. The following requirements set forth in the NOTIFICATION of MISSING REQUIREMENTS mailed 04/16/2001 have not been completed.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

- Oath or declaration of the inventors, in compliance with 37 CFR 1.497(a) and (b), identifying the application by the International application number and international filing date.
- \$130 Surcharge for providing the oath or declaration later than 30 months from the priority date (37 CFR 1.492(e)) is required.

Applicant is required to complete the response within a time limit of ONE MONTH from the date of this Notification or within the time remaining in the response set forth in the Notification of Missing Requirements, whichever is the longer. No extension of this time limit may be granted under 37 CFR 1.136, but the period for response set in the Notification of Missing Requirements may be extended under 37 CFR 1.136(a).

Additionally the following defects have been observed:

- Additional claim fees of \$240 as a non-small entity, including any required multiple dependent claim fee,

are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.

SUMMARY OF FEES DUE:

Total additional fees required for this application is **\$370** for a Large Entity:

- **\$130** Late oath or declaration Surcharge.
- Total additional claim fee(s) for this application is **\$240**
 - **\$240** for **5** independent claims over 3.

The following items **MUST** be furnished within the period set forth below:

- The nucleotide and/or amino acid sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 CFR 1.821-1.825 for the following reason(s):
 - The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A substitute computer readable form must be submitted as required by 37 CFR 1.825(d).
 - **APPLICANT MUST PROVIDE:**
 - An initial or substitute computer readable form (CRF) of the "Sequence Listing."
- For questions regarding compliance to 37 CFR 1.821-1.825 requirements, please contact:
 - For Rules Interpretation, call (703) 308-4216
 - To Purchase PatentIn Software, call (703) 306-2600
 - For PatentIn Software Program Help, call (703) 306-4119 or e-mail at patin21help@uspto.gov or patin3help@uspto.gov

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

*A copy of this notice **MUST** be returned with the response.*

PATRICIA A BOOKER

Telephone: (703) 305-3738

PART 1 - ATTORNEY/APPLICANT COPY

U.S. APPLICATION NUMBER NO.	INTERNATIONAL APPLICATION NO.	ATTY. DOCKET NO.
09/786,108	PCT/US99/19902	3875-4138US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): David McKinnon and Jane Dixon
Serial No.: 09/786,108
Filed: February 27, 2001
For: Mammalian ELK Potassium Channel Genes
Group Art Unit: TBA
Examiner: TBA

Commissioner for Patents
Washington, D.C. 20231

RESPONSE

Sir:

This is in response to the Notification of Missing Parts Requirement under 35 U.S.C. 371.

Enclosed herewith is a signed Combined Declaration and Power of Attorney. The signed Combined Declaration and Power of Attorney now correctly identifies PCT Application No. PCT/US99/19902 filed August 31, 1999.

Also enclosed is a paper and disc copy of the corrected Sequence Listing. SEQ ID NOs. 5 and 6 are now amended and correctly identified as PRT sequences. Please replace the originally filed Sequence Listing. The STIC Examiner pointed out that SEQ ID NOs. 5 and 6 are in error. The sequences are now correctly identified.

Support for the amendment is to be found in the specification at page 43, lines 10 and 11.

Attached is a copy of the Notice as required.

REMARKS

The Commissioner is hereby authorized to charge any additional fees which may be required for the timely consideration of this amendment under 37 C.F.R. §§ 1.16 and 1.17, or credit any overpayment to Deposit Account No. 13-4500, Order No. 3875-4138US1.

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: June 18, 2001

By:



Maria C.H. Lin
Registration No. 29, 323

Correspondence Address:

MORGAN & FINNEGAN, L.L.P.
345 Park Avenue
New York, NY 10154-0053
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(212) 751-6849 Facsimile

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.51)

TBA

INTERNATIONAL APPLICATION
PCT/US99/19902

INTERNATIONAL FILING DATE
31 August 1999 (31.08.99)

PRIORITY DATE CLAIMED
31 August 1998 (31.08.98)

TITLE OF INVENTION

MAMMALIAN *elk* POTASSIUM CHANNEL GENES

APPLICANT(S) FOR DO/EO/US

David MCKINNON; Jane E. DIXON

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371 (b) and PCT Articles 22 and 39 (1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith.
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☒ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International application into English (35 U.S.C. 371(c)(2)), with oath
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included.

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.

☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification and Figs. 1 and 2.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or Information:

Verified Certification of Express Mailing Date
Return postcard.

Shen

Case No. 3875-4138US1 Serial No. 09/786,108
Date Mailed June 18, 2001 ATTY MCHL
Date Due in the Patent Office _____

The return of this post card, properly stamped, will
acknowledge receipt in the Patent & Trademark Office
of the following:

- JCH Rec'd PCT/PTO 18 JUN 2001**
1. - 1. Response;
 2. - 2. Copy of Notice to Missing Parts;
 2. - 3. Executed Combined Declaration and Power of Attorney;
 3. - 4. Recordation Cover Sheet;
 5. - 5. Executed Assignment;
 4. - 6. Statement Under 37 CFR 1.821(f);
 5. - 7. Paper copy of Sequence Listing;
 8. - 8. Disc copy of Sequence Listing;
 6. - 9. Express Mail Certificate #EL 762 624 518US; and
 10. - 10. Postcard - self addressed and stamped.

SEQUENCE LISTING

<110> DIXON, JANE
MCKINNON, DAVID

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Arg Leu Pro Ser Ile Val Glu Asp Glu Glu Glu Glu Val Glu Glu
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Glu Glu Thr Thr Ser Leu Ser Pro Ile Tyr Thr Arg Gly Ser Ser Val
 725 730 735

Ser His Ser Lys Lys Thr Gly Ser Ser Lys Ser Tyr Leu Gly Leu Ser
 740 745 750

Leu Lys Gln Leu Thr Ser Gly Thr Val Pro Phe His Ser Pro Ile Arg
 755 760 765
 Val Ser Ser Ala Asn Ser Pro Lys Thr Lys Gln Glu Ala Asp Pro Pro
 770 775 780
 Asn His Gly Thr Arg Lys Glu Lys Asn Leu Lys Val Gln Leu Cys Ser
 785 790 795 800
 Leu Gly Thr Ala Gly Thr Pro Glu Leu Ser Pro Arg Ile Val Asp Gly
 805 810 815
 Ile Glu Asp Gly Asn Ser Ser Glu Glu Thr Gln Thr Phe Asp Phe Gly
 820 825 830
 Ser Glu Gln Ile Arg Pro Glu Pro Arg Ile Ser Pro Ser Leu Gly Glu
 835 840 845
 Ser Glu Ile Gly Ala Ala Phe Leu Phe Ile Lys Ala Glu Glu Thr Lys
 850 855 860
 Gln Gln Ile Asn Lys Leu Asn Ser Glu Val Thr Thr Leu Thr Gln Glu
 865 870 875 880
 Val Ser Gln Leu Gly Lys Asp Met Arg Ser Ile Met Gln Leu Leu Glu
 885 890 895
 Asn Ile Leu Ser Pro Gln Gln Pro Ser Gln Phe Cys Ser Leu His Pro
 900 905 910
 Thr Ser Ile Cys Pro Ser Arg Glu Ser Phe Gln Thr Arg Val Ser Trp
 915 920 925
 Ser Ala His Gln Pro Cys Leu His Leu Gln Ala Asn Gly Ala His Leu
 930 935 940
 Tyr His Gly Asn Val Thr Ser Asp Ile Trp Ser Val Asp Pro Ser Leu
 945 950 955 960
 Val Gly Ser Asn Pro Gln Arg Thr Glu Ala His Glu Gln Ser Pro Val
 965 970 975
 Asp Ser Glu Leu His His Ser Pro Asn Leu Ala Tyr Ser Pro Ser His
 980 985 990
 Cys Gln Val Ile Gln Glu Gly His Leu Gln Phe Leu Arg Cys Ile Ser
 995 1000 1005

Pro His Ser Asp Thr Thr Leu Thr Pro Leu Gln Ser Ile Ser Ala Thr
 1010 1015 1020

Leu Ser Ser Ser Val Cys Ser Ser Ser Glu Thr Ser Leu His Leu Val
 1025 1030 1035 1040

Leu Pro Ser Arg Ser Glu Glu Gly Ser Ile Thr His Gly Pro Val Ser
 1045 1050 1055

Ser Phe Ser Leu Glu Asn Leu Pro Gly Ser Trp Asp Arg Glu Gly Met
 1060 1065 1070

Met Ser Ala Ser Thr Glu Pro Leu Glu Asn Phe Pro Val Glu Val Val
 1075 1080 1085

Thr Ser Thr Ala Asp Val Lys Asp Ser Lys Ala Ile Asn Val
 1090 1095 1100

<210> 3

<211> 154

<212> PRT

<213> RAT

<220>

<223> elk 2

<400> 3

Lys Gly Glu Val Ala Leu Phe Leu Val Ser His Lys Asp Ile Ser Glu
 1 5 10 15

Thr Lys Asn Arg Gly Gly Pro Asp Asn Trp Lys Glu Arg Gly Gly Gly
 20 25 30

Arg Arg Arg Tyr Gly Arg Ala Gly Ser Lys Gly Phe Asn Ala Asn Arg
 35 40 45

Arg Arg Ser Arg Ala Val Leu Tyr His Leu Ser Gly His Leu Gln Lys
 50 55 60

Gln Pro Lys Gly Lys His Lys Leu Asn Lys Gly Val Phe Gly Glu Lys
 65 70 75 80

Pro Asn Leu Pro Glu Tyr Lys Val Ala Ala Ile Arg Lys Ser Pro Phe
 85 90 95

Ile Leu Leu His Cys Gly Ala Leu Arg Ala Thr Trp Asp Gly Phe Ile
 100 105 110

Leu Leu Ala Thr Leu Tyr Val Ala Val Thr Val Pro Tyr Ser Val Cys
115 120 125

Val Ser Thr Ala Arg Glu Pro Ser Ala Ala Arg Gly Pro Pro Ser Val
130 135 140

Cys Asp Leu Ala Val Glu Val Leu Phe Ile
145 150

<210> 4

<211> 141

<212> PRT

<213> RAT

<220>

<223> eag 2

<400> 4

Val Ile Leu Ile Leu Thr Phe Tyr Thr Ala Ile Met Val Pro Tyr Asn
1 5 10 15

Val Ser Phe Lys Thr Lys Gln Asn Asn Ile Ala Trp Leu Val Leu Asp
20 25 30

Ser Val Val Asp Val Ile Phe Leu Val Asp Ile Val Leu Asn Phe His
35 40 45

Thr Thr Phe Val Gly Pro Gly Gly Glu Val Ile Ser Asp Pro Lys Leu
50 55 60

Ile Arg Met Asn Tyr Leu Lys Thr Trp Phe Val Ile Asp Leu Leu Ser
65 70 75 80

Cys Leu Pro Tyr Asp Ile Ile Asn Ala Phe Glu Asn Val Asp Glu Gly
85 90 95

Ile Ser Ser Leu Phe Ser Ser Leu Lys Val Val Arg Leu Leu Arg Leu
100 105 110

Gly Arg Val Ala Arg Lys Leu Asp His Tyr Leu Glu Tyr Gly Ala Ala
115 120 125

Val Leu Val Leu Leu Val Cys Val Phe Gly Leu Val Ala
130 135 140

<210> 5
<211> 21
<212> PRT
<213> RAT

<220>
<223> eag

<400> 5
Thr Thr Tyr Ala Ala Arg Arg Cys Asn Arg Tyr Asn Thr Gly Gly Gly
1 5 10 15
Ala Tyr Thr Gly Gly
20

<210> 6
<211> 24
<212> PRT
<213> RAT

<220>
<223> eag

<400> 6
Arg Thr Ala Cys Cys Ala Asp Ala Thr Arg Cys Ala Asn Gly Cys Asn
1 5 10 15
Ala Gly Cys Cys Ala Arg Thr Gly
20

<210> 7
<211> 20
<212> DNA
<213> RAT

<220>
<223> eag

<400> 7
cgggatcctt gtggacaaac

20

<210> 8
<211> 20
<212> DNA
<213> RAT

<220>

<223> eag

<400> 8

cggaccaaca gtaaggactt

20

<210> 9

<211> 21

<212> DNA

<213> RAT

<220>

<223> eag

<400> 9

gtgataccca taaagaatga g

21

<210> 10

<211> 17

<212> DNA

<213> RAT

<220>

<223> eag

<400> 10

ctgtaacacg acttaaa

17

<210> 11

<211> 17

<212> DNA

<213> RAT

<220>

<223> eag

<400> 11

tgctgcggtg agacacg

17

<210> 12

<211> 19

<212> DNA

<213> RAT

<220>

<223> eag

<400> 12

gcgtggtttg tgtactggt

19

<210> 13

<211> 464

<212> DNA

<213> RAT

<220>

<223> elk 2

<400> 13

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ggaggccctg acaactggaa ggagagaggt ggtggccgac gcagatatgg tcgggcagga 120
tccaaaggct ttaatgcaa tcggaggcgc agccgggagg ttctctacca cctctctggt 180
cacctgcaga aacaacccaa gggcaagcac aaactcaata aggggtgtgtt tggagagaag 240
ccaaatttgc ccgaatataa agtcgctgct atccggaagt caccctttat cctgctgcac 300
tgtggggctc tgagagccac ctgggatggc ttcactctgc tcgccacgct ctacgtggct 360
gtcactgtgc catacagcgt gtgtgtgagc acagcacggg agcccagtgc tgcccgtggc 420
ccacctagtg tctgtgacct ggccgtggaa gtcctcttca tctt 464

<210> 14

<211> 423

<212> DNA

<213> RAT

<220>

<223> eag 2

<400> 14

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acaaaacaga acaatatcgc ctggctgggt ctggacagcg tggaggacgt tatttttctg 120
gtggacatcg ttttaaactt tcacacgact tttgtggggc cgggtggaga ggtcatttct 180
gacccaaaac tcatacggat gaactatctg aaaacttggt ttgtgattga tctgctgtct 240
tgttttacct atgacatcat caatgccttt gaaaatgtgg atgagggaat cagcagctc 300
ttcagctctt taaagggtgg acgcctctta cgcctgggcc gtgttgctag gaaactggac 360
cattacctgg aatatggagc agcggtcctt gtgctcctgg tatgtgtgtt tggactgggt 420
gcc 423

<210> 15

<211> 1163

<212> PRT

<213> RAT

<220>

<223> erg 1

<400> 15

Met Pro Val Arg Arg Gly His Val Ala Pro Gln Asn Thr Phe Leu Asp
1 5 10 15

Thr Ile Ile Arg Lys Phe Glu Gly Gln Ser Arg Lys Phe Ile Ile Ala
20 25 30

Asn Ala Arg Val Glu Asn Cys Ala Val Ile Tyr Cys Asn Asp Gly Phe
35 40 45

Cys Glu Leu Cys Gly Tyr Ser Arg Ala Glu Val Met Gln Arg Pro Cys
50 55 60

Thr Cys Asp Phe Leu His Gly Pro Arg Thr Gln Arg Arg Ala Ala Ala
65 70 75 80

Gln Ile Ala Gln Ala Leu Leu Gly Ala Glu Glu Arg Lys Val Glu Ile
85 90 95

Ala Phe Tyr Arg Lys Asp Gly Ser Cys Phe Leu Cys Leu Val Asp Val
100 105 110

Val Pro Val Lys Asn Glu Asp Gly Ala Val Ile Met Phe Ile Leu Asn
115 120 125

Phe Glu Val Val Met Glu Lys Asp Met Val Gly Ser Pro Ala His Asp
130 135 140

Thr Asn His Arg Gly Pro Ser Thr Ser Trp Leu Ala Ser Gly Arg Ala
145 150 155 160

Lys Thr Phe Arg Leu Lys Leu Pro Ala Leu Leu Ala Leu Thr Ala Arg
165 170 175

Glu Ser Pro Met Arg Thr Gly Ser Thr Gly Ser Pro Gly Ala Pro Gly
180 185 190

Ala Val Val Val Asp Val Asp Leu Thr Pro Ala Ala Pro Ser Ser Glu
195 200 205

Ser Leu Ala Leu Asp Glu Val Ser Ala Met Asp Asn His Val Ala Gly
210 215 220

Leu Gly Pro Ala Glu Glu Arg Arg Ala Leu Val Gly Pro Ala Ser Ala
 225 230 235 240

Ser Pro Val Ala Ser Ile Pro Gly Pro His Pro Ser Pro Arg Ala Gln
 245 250 255

Ser Leu Asn Pro Asp Ala Ser Gly Ser Ser Cys Ser Leu Ala Arg Thr
 260 265 270

Arg Ser Arg Glu Ser Cys Ala Ser Val Arg Arg Ala Ser Ser Ala Asp
 275 280 285

Asp Ile Glu Ala Met Arg Ala Gly Ala Leu Pro Leu Pro Pro Arg His
 290 295 300

Ala Ser Thr Gly Ala Met His Pro Leu Arg Ser Gly Leu Leu Asn Ser
 305 310 315 320

Thr Ser Asp Ser Asp Leu Val Arg Tyr Arg Thr Ile Ser Lys Ile Pro
 325 330 335

Gln Ile Thr Leu Asn Phe Val Asp Leu Lys Gly Asp Pro Phe Leu Ala
 340 345 350

Ser Pro Thr Ser Asp Arg Glu Ile Ile Ala Pro Lys Ile Lys Glu Arg
 355 360 365

Thr His Asn Val Thr Glu Lys Val Thr Gln Val Leu Ser Leu Gly Ala
 370 375 380

Asp Val Leu Pro Glu Tyr Lys Leu Gln Ala Pro Arg Ile His Arg Trp
 385 390 395 400

Thr Ile Leu His Tyr Ser Pro Phe Lys Ala Val Trp Asp Trp Leu Ile
 405 410 415

Leu Leu Leu Val Ile Tyr Thr Ala Val Phe Thr Pro Tyr Ser Ala Ala
 420 425 430

Phe Leu Leu Lys Glu Thr Glu Asp Gly Ser Gln Ala Pro Asp Cys Gly
 435 440 445

Tyr Ala Cys Gln Pro Leu Ala Val Val Asp Leu Leu Val Asp Ile Met
 450 455 460

Phe Ile Val Asp Ile Leu Ile Asn Phe Arg Thr Thr Tyr Val Asn Ala
 465 470 475 480

Asn Glu Glu Val Val Ser His Pro Gly Arg Ile Ala Val His Tyr Phe			
485	490	495	
Lys Gly Trp Phe Leu Ile Asp Met Val Ala Ala Ile Pro Phe Asp Leu			
500	505	510	
Leu Ile Phe Gly Ser Gly Ser Glu Glu Leu Ile Gly Leu Leu Lys Thr			
515	520	525	
Ala Arg Leu Leu Arg Leu Val Arg Val Ala Arg Lys Leu Asp Arg Tyr			
530	535	540	
Ser Glu Tyr Gly Ala Ala Val Leu Phe Leu Leu Met Cys Thr Phe Ala			
545	550	555	560
Leu Ile Ala His Trp Leu Ala Cys Ile Trp Tyr Ala Ile Gly Asn Met			
565	570	575	
Glu Gln Pro His Met Asp Ser His Ile Gly Trp Leu His Asn Leu Gly			
580	585	590	
Asp Gln Ile Gly Lys Pro Tyr Asn Ser Ser Gly Leu Gly Gly Pro Ser			
595	600	605	
Ile Lys Asp Lys Tyr Val Thr Ala Leu Tyr Phe Thr Phe Ser Ser Leu			
610	615	620	
Thr Ser Val Gly Phe Gly Asn Val Ser Pro Asn Thr Asn Ser Glu Lys			
625	630	635	640
Ile Phe Ser Ile Cys Val Met Leu Ile Gly Ser Leu Met Tyr Ala Ser			
645	650	655	
Ile Phe Gly Asn Val Ser Ala Ile Ile Gln Arg Leu Tyr Ser Gly Thr			
660	665	670	
Ala Arg Tyr His Thr Gln Met Leu Arg Val Arg Glu Phe Ile Arg Phe			
675	680	685	
His Gln Ile Pro Asn Pro Leu Arg Gln Arg Leu Glu Glu Tyr Phe Gln			
690	695	700	
His Ala Trp Ser Tyr Thr Asn Gly Ile Asp Met Asn Ala Val Leu Lys			
705	710	715	720
Gly Phe Pro Glu Cys Leu Gln Ala Asp Ile Cys Leu His Leu Asn Arg			
725	730	735	

Ser Leu Leu Gln His Cys Lys Pro Phe Arg Gly Ala Thr Lys Gly Cys
 740 745 750

Leu Arg Ala Leu Ala Met Lys Phe Lys Thr Thr His Ala Pro Pro Gly
 755 760 765

Asp Thr Leu Val His Ala Gly Asp Leu Leu Thr Ala Leu Tyr Phe Ile
 770 775 780

Ser Arg Gly Ser Ile Glu Ile Leu Arg Gly Asp Val Val Val Ala Ile
 785 790 795 800

Leu Gly Lys Asn Asp Ile Phe Gly Glu Pro Leu Asn Leu Tyr Ala Arg
 805 810 815

Pro Gly Lys Ser Asn Gly Asp Val Arg Ala Leu Thr Tyr Cys Asp Leu
 820 825 830

His Lys Ile His Arg Asp Asp Leu Leu Glu Val Leu Asp Met Tyr Pro
 835 840 845

Glu Phe Ser Asp His Phe Trp Ser Ser Leu Glu Ile Thr Phe Asn Leu
 850 855 860

Arg Asp Thr Asn Met Ile Pro Gly Ser Pro Ser Ser Ala Glu Leu Glu
 865 870 875 880

Ser Gly Phe Asn Arg Gln Arg Lys Arg Lys Leu Ser Phe Arg Arg Arg
 885 890 895

Thr Asp Lys Asp Thr Glu Gln Pro Gly Glu Val Ser Ala Leu Gly Gln
 900 905 910

Gly Pro Ala Arg Val Gly Pro Gly Pro Ser Cys Arg Gly Gln Pro Gly
 915 920 925

Gly Pro Trp Gly Glu Ser Pro Ser Ser Gly Pro Ser Ser Pro Glu Ser
 930 935 940

Ser Glu Asp Glu Gly Pro Gly Arg Ser Ser Ser Pro Leu Arg Leu Val
 945 950 955 960

Pro Phe Ser Ser Pro Arg Pro Pro Gly Asp Ser Pro Gly Gly Glu Pro
 965 970 975

Leu Thr Glu Asp Gly Glu Lys Ser Ser Asp Thr Cys Asn Pro Leu Ser
 980 985 990

Gly Ala Phe Ser Gly Val Ser Asn Ile Phe Ser Phe Trp Gly Asp Ser
 995 1000 1005

Arg Gly Arg Gln Tyr Gln Glu Leu Pro Arg Cys Pro Ala Pro Ala Pro
 1010 1015 1020

Ser Leu Leu Asn Ile Pro Leu Ser Ser Pro Gly Arg Arg Ser Arg Gly
 1025 1030 1035 1040

Asp Val Glu Ser Arg Leu Asp Ala Leu Gln Arg Gln Asp Asn Arg Leu
 1045 1050 1055

Glu Thr Arg Leu Ser Ala Asp Met Ala Thr Val Leu Gln Leu Leu Gln
 1060 1065 1070

Arg Gln Met Thr Leu Val Pro Pro Ala Tyr Ser Ala Val Thr Thr Pro
 1075 1080 1085

Gly Pro Gly Pro Thr Ser Thr Ser Pro Leu Leu Pro Val Gly Pro Val
 1090 1095 1100

Pro Thr Leu Thr Leu Asp Ser Leu Ser Gln Val Ser Gln Phe Val Ala
 1105 1110 1115 1120

Phe Glu Glu Leu Pro Ala Gly Ala Pro Glu Leu Pro Gln Asp Gly Pro
 1125 1130 1135

Thr Arg Arg Leu Ser Leu Pro Gly Gln Leu Gly Ala Leu Thr Ser Gln
 1140 1145 1150

Pro Leu His Arg His Gly Ser Asp Pro Gly Ser
 1155 1160

<210> 16

<211> 962

<212> PRT

<213> RAT

<220>

<223> eag 1

<400> 16

Met Thr Met Ala Gly Gly Arg Arg Gly Leu Val Ala Pro Gln Asn Thr
 1 5 10 15

Phe Leu Glu Asn Ile Val Arg Arg Ser Asn Asp Thr Asn Phe Val Leu

	20		25		30
Gly Asn Ala Gln Ile Val Asp Trp Pro Ile Val Tyr Ser Asn Asp Gly					
	35		40		45
Phe Cys Lys Leu Ser Gly Tyr His Arg Ala Glu Val Met Gln Lys Ser					
	50		55		60
Ser Ala Cys Ser Phe Met Tyr Gly Glu Leu Thr Asp Lys Asp Thr Val					
	65		70		75
					80
Glu Lys Val Arg Gln Thr Phe Glu Asn Tyr Glu Met Asn Ser Phe Glu					
		85		90	
					95
Ile Leu Met Tyr Lys Lys Asn Arg Thr Pro Val Trp Phe Phe Val Lys					
	100		105		110
Ile Ala Pro Ile Arg Asn Glu Gln Asp Lys Val Val Leu Phe Leu Cys					
	115		120		125
Thr Phe Ser Asp Ile Thr Ala Phe Lys Gln Pro Ile Lys Asp Asp Ser					
	130		135		140
Cys Lys Gly Trp Gly Lys Phe Ala Arg Leu Thr Arg Ala Leu Thr Ser					
	145		150		155
					160
Ser Arg Gly Val Leu Gln Gln Leu Ala Pro Ser Val Gln Lys Gly Glu					
		165		170	
					175
Asn Val His Lys His Ser Arg Leu Ala Glu Val Leu Gln Leu Gly Ser					
	180		185		190
Asp Ile Leu Pro Gln Tyr Lys Gln Glu Ala Pro Lys Pro Pro His Ile					
	195		200		205
Ile Leu His Tyr Cys Val Phe Lys Thr Thr Thr Trp Asp Trp Ile Ile					
	210		215		220
Leu Ile Leu Thr Phe Tyr Thr Ala Ile Leu Val Pro Tyr Asn Val Ser					
	225		230		235
					240
Phe Lys Thr Arg Gln Asn Asn Val Ala Trp Leu Val Val Asp Ser Ile					
		245		250	
					255
Val Asp Val Ile Phe Leu Val Asp Ile Val Leu Asn Phe His Thr Thr					
	260		265		270
Phe Val Gly Pro Ala Gly Glu Val Ile Ser Asp Pro Lys Leu Ile Arg					

275	280	285
Met Asn Tyr Leu Lys Thr Trp Phe Val Ile Asp Leu Leu Ser Cys Leu		
290	295	300
Pro Tyr Asp Val Ile Asn Ala Phe Glu Asn Val Asp Glu Gly Ile Ser		
305	310	315 320
Ser Leu Phe Ser Ser Leu Lys Val Val Arg Leu Leu Arg Leu Gly Arg		
325	330	335
Val Ala Arg Lys Leu Asp His Tyr Ile Glu Tyr Gly Ala Ala Val Leu		
340	345	350
Val Leu Leu Val Cys Val Phe Gly Leu Ala Ala His Trp Met Ala Cys		
355	360	365
Ile Trp Tyr Ser Ile Gly Asp Tyr Glu Ile Phe Asp Glu Asp Thr Lys		
370	375	380
Thr Ile Arg Asn Asn Ser Trp Leu Tyr Gln Leu Ala Leu Asp Ile Gly		
385	390	395 400
Thr Pro Tyr Gln Phe Asn Gly Ser Gly Ser Gly Lys Trp Glu Gly Gly		
405	410	415
Pro Ser Lys Asn Ser Val Tyr Ile Ser Ser Leu Tyr Phe Thr Met Thr		
420	425	430
Ser Leu Thr Ser Val Gly Phe Gly Asn Ile Ala Pro Ser Thr Asp Ile		
435	440	445
Glu Lys Ile Phe Ala Val Ala Ile Met Met Ile Gly Ser Leu Leu Tyr		
450	455	460
Ala Thr Ile Phe Gly Asn Val Thr Thr Ile Phe Gln Gln Met Tyr Ala		
465	470	475 480
Asn Thr Asn Arg Tyr His Glu Met Leu Asn Ser Val Arg Asp Phe Leu		
485	490	495
Lys Leu Tyr Gln Val Pro Lys Gly Leu Ser Glu Arg Val Met Asp Tyr		
500	505	510
Ile Val Ser Thr Trp Ser Met Ser Arg Gly Ile Asp Thr Lys Lys Val		
515	520	525
Leu Gln Ile Cys Pro Lys Asp Asn Arg Ala Asp Ile Cys Val His Leu		

530	535	540
Asn Arg Lys Val Phe Lys Glu His Pro Ala Phe Arg Leu Ala Ser Asp		
545	550	555 560
Gly Cys Leu Arg Ala Leu Ala Met Glu Phe Gln Thr Val His Cys Ala		
565	570	575
Pro Gly Asp Leu Ile Tyr His Ala Gly Glu Asp Val Asp Ser Leu Cys		
580	585	590
Phe Val Val Ser Gly Ser Leu Glu Val Ile Gln Asp Asp Glu Val Val		
595	600	605
Ala Ile Leu Gly Lys Gly Asp Val Phe Gly Asp Val Phe Trp Lys Glu		
610	615	620
Ala Thr Leu Ala Gln Ser Cys Ala Asn Val Arg Ala Leu Thr Tyr Cys		
625	630	635 640
Asp Leu His Val Ile Lys Arg Asp Ala Leu Gln Lys Val Leu Glu Phe		
645	650	655
Tyr Thr Ala Phe Ser His Ser Phe Ser Arg Asn Leu Ile Leu Thr Tyr		
660	665	670
Asn Leu Arg Lys Arg Ile Val Phe Arg Lys Ile Ser Asp Val Lys Arg		
675	680	685
Glu Glu Glu Glu Arg Met Lys Arg Lys Asn Glu Ala Pro Leu Ile Leu		
690	695	700
Pro Pro Asp His Pro Val Arg Arg Leu Phe Gln Arg Phe Arg Gln Gln		
705	710	715 720
Lys Glu Ala Arg Leu Ala Ala Glu Arg Gly Gly Arg Asp Leu Asp Asp		
725	730	735
Leu Asp Val Glu Lys Gly Asn Ala Leu Thr Asp His Thr Ser Ala Asn		
740	745	750
His Ser Leu Val Lys Ala Ser Val Val Thr Val Arg Glu Ser Pro Ala		
755	760	765
Thr Pro Val Ser Phe Gln Ala Ala Ser Thr Ser Thr Val Ser Asp His		
770	775	780
Ala Lys Leu His Ala Pro Gly Ser Glu Cys Leu Gly Pro Lys Ala Gly		

785	790	795	800
Gly Gly Asp Pro Ala Lys Arg Lys Gly Trp Ala Arg Phe Lys Asp Ala			
805	810	815	
Cys Gly Lys Gly Glu Asp Trp Asn Lys Val Ser Lys Ala Glu Ser Met			
820	825	830	
Glu Thr Leu Pro Glu Arg Thr Lys Ala Ser Gly Glu Ala Thr Leu Lys			
835	840	845	
Lys Thr Asp Ser Cys Asp Ser Gly Ile Thr Lys Ser Asp Leu Arg Leu			
850	855	860	
Asp Asn Val Gly Glu Ala Pro Ser Pro Gln Asp Arg Ser Pro Ile Leu			
865	870	875	880
Ala Glu Val Lys His Ser Phe Tyr Pro Ile Pro Glu Gln Thr Leu Gln			
885	890	895	
Ala Thr Val Leu Glu Val Lys His Glu Leu Lys Glu Asp Ile Lys Ala			
900	905	910	
Leu Asn Ala Lys Met Thr Ser Ile Glu Lys Gln Leu Ser Glu Ile Leu			
915	920	925	
Arg Ile Leu Met Ser Arg Gly Ser Ser Gln Ser Pro Gln Asp Ile Cys			
930	935	940	
Glu Val Ser Arg Pro Gln Ser Pro Glu Ser Asp Arg Asp Ile Phe Gly			
945	950	955	960
Ala Ser			

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): David McKinnon and Jane Dixon

Group Art Unit: TBA

Serial No.: 09/786,108

Examiner: Patricia A. Booker

Filed: February 27, 2001

For: Mammalian ELK Potassium Channel Genes

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ALEXANDRIA, VA 22313-1450

STATEMENT UNDER 37 C.F.R. §§ 1.821(F) OR §1.825(b)

Sir:


I hereby certify that:

☐ The paper Sequence Listing and computer readable form of the Sequence Listing submitted herewith are identical (37 C.F.R. §1.821(f)).

☒ The substitute paper Sequence Listing and substitute computer readable form of the Sequence Listing submitted herewith are identical. No new matter is included. (37 C.F.R. § 1.825(b)).

Respectfully submitted,
MORGAN & FINNEGAN, L.L.P.

Dated: May 6, 2003



Keith J. McWha
Registration No. 44,235

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